margin of a huge laceolithic sheet of eruptive rock a mile and a quarter thick, 35 poiles long and 17 miles wide. This sheet is now in the form of a beat shaped syncline, with its pointed end to the southwest and its square end to the northeast. The rock composing this sheet is norite at the outer (and lower) edge, merging into granite or grano-diorite at the inner (upper) edge. The ore bodies are round the margin of the norite or along dike-like offsets from it, and have evidently segregated from the rock while still molten, though they may have undergone later rearrangement by circulating water.

It is common to find oro deposits associated with eruptive rocks in such a way as to suggest that the emptive furnished the ore; but in a large majority of the examples described the ores themselves have been transported and deposited by cireulating water. In the Sudbury region, however, there is good reason to believo that the ore accumulated at the edges of the eruptive sheet while it was still fluid enough to permit the segregation and sinking of the heavier ingredients, probably, in part at least, under the action of gravitation. At a later time, however, there was in many deposits a considerable amount of water action, particularly in those along offsets. The conditions just mentioned are of very great interest, both from the geological and the economic side, and the evidence regarding them will be given in detail at a later stage.

While special attention was paid to the great eruptive sheet and its ore bodies, the adjoining rocks also have been collected and to some oxtent carefully studied and mapped; but this work has been subordinated to the main object of the investigation. it has been found that everywhere the laccolithic sheet rests on ancient, mainly erystalline, rocks which have hitherto been mapped and described as Laurentian and Huroman, while its upper surface underlies a series of later rocks which Dr. Bell suggests may be Cambrian in age. This inner rock series consists entirely of sediments mainly ordinary clastics, such as conglomerate, slate and sandstone, but near the base including much pyroclastic materials, volcanic ash, lapilli, etc. These stratified rocks have been bent into synclines and anticlines during the formation of the main syncline. The underlying more ancient rocks present much less regularity, and their relationthips are less certain. The rocks mapped as Huronian are chiefly sediments such as quartzite and graywacké tilted into positions more or less approaching the vertical, and often recrystallized into schists. With them are basic eruptives of great variety, including lava flows and an older, more basic, norito than that of one nickel-bearing rock. The rocks mapped as Laurentian include granite and gneiss younger than the Hureman, but older than the nickel-bearing eruptive and the overlying sediments. The youngest rocks of the region are the laccolithic sheet connected with the nickel ores and certain still later dikes of olivine diabase and granite.

It will be seen that the region presents a wide range of interesting features to the mining engineer as well as to the geologist, and the recent developments in the way of mining operations and the making of wagon roads and railroads enable one to study its southern side in a very satisfactory way; but the northern half is still forest eovered for the most part and rather inaccessible.

The mining community and prospectors are accustomed to speak of two nickel langes, the main or southern one, and the northern one. Our mapping proves that there is really only one range, which is continuous with the outer edge of the sheet of nickel-bearing rock. However in a modified sense the two ranges may still be distinguished, since the extreme west and the extreme east of the laccolithic sheet have not yet disclosed ore bodies of importance. In a general way there are more numerous and larger ore bodies, so far as known, on the southern than on the northern range, though there is great irregularity in this respect on both ranges.

As will be shown later the topography of the region has very close relations with the arrangement of the laccolithic sheet and its adjoining rocks, so that the surface forms of the area give aid in studying its geology.

1 Ma (111.)

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